

PAH Spectroscopy: Past, Present and Future

Andrew Mattioda, Research Scientist, NASA Ames Research Center

Andrew.mattioda@nasa.gov

Since their discovery in the 1970's, astronomers, astrophysicists and astrochemists have been intrigued by the nearly ubiquitous unidentified infrared emission (UIR) bands. In the 1980's, investigators determined the most probably source of these emissions was a family of molecules known as Polycyclic Aromatic Hydrocarbons or simply PAHs. In order to better understand these interstellar IR features and utilize them as chemical probes of the cosmos, laboratory spectroscopists have spent the last three decades investigating the spectroscopy of PAHs under astrophysically relevant conditions. This presentation will discuss the similarities and differences in the spectroscopic properties of PAHs as one goes from the Far to Mid to Near infrared wavelength regions and probe the changes observed in PAH spectra as they go from neutral to ionized molecules suspended in an inert gas matrix, to PAHs in a water ice matrix and as a thin film. In selected instances, the experimental results will be compared to theoretical values. The presentation will conclude with a discussion on the future directions of PAH spectroscopy.